Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

University of Maine.

Maine Agricultural Experiment Station

ORONO

BULLETIN 225 FEBRUARY 1914

CURRANT AND GOOSEBERRY APHIDS IN MAINE

CONTENTS.

PAGE
Aphis varians 50
Aphis sanborni 52
Rhopalosiphum lactucae? 53
Myzus ribis 55
Myzus dispar 56
Macrosiphum lactucae 57
Macrosiphum sp. 60
Schizoneura ulmi (fodiens) 60
Food Plant Catalogue. Part IV 61

MAINE
AGRICULTURAL EXPERIMENT STATION
ORONO, MAINE.

THE STATION COUNCIL.

PRESIDENT ROBERT J. ALEY,	*President*
DIRECTOR CHARLES D. WOODS.	*Secretary*
CHARLES L. JONES, Corinna,	*Committee of Board of Trustees*
FREELAND JONES, Bangor,	
WILLIAM A. MARTIN, Houlton,	
JOHN A. ROBERTS, Norway,	*Commissioner of Agriculture*
EUGENE H. LIBBY, Auburn,	*State Grange*
HOWARD L. KEYSER, Greene,	*State Pomological Society*
RUTILLUS ALDEN, Winthrop,	*State Dairymen's Association*
LEONARD C. HOLSTON, Cornish,	*Maine Livestock Breeders' Association*
WILLIAM G. HUNTON, Readfield.	*Maine Seed Improvement Association*

AND THE HEADS AND ASSOCIATES OF STATION DEPARTMENTS, AND THE DEAN OF THE COLLEGE OF AGRICULTURE.

THE STATION STAFF.

ADMINISTRATION	CHARLES D. WOODS, Sc. D.,	*Director*
	BLANCHE F. POOLER,	*Clerk*
	GEM M. COOMBS,	*Stenographer*
	JANIE L. FAYLE,	*Stenographer*
BIOLOGY	RAYMOND PEARL, PH. D.,	*Biologist*
	FRANK M. SURFACE, PH. D.,	*Biologist*
	MAYNIE R. CURTIS, PH. D.,	*Assistant*
	CLARENCE W. BARBER, B. S.,	*Assistant*
	JOHN RICE MINER, B. A.,	*Computer*
	HAZEL F. MARINER, B. A.,	*Clerk*
	FRANK TENNEY,	*Poultryman*
CHEMISTRY	JAMES M. BARTLETT, M. S.,	*Chemist*
	HERMAN H. HANSON, M. S.,	*Associate*
	EDWARD E. SAWYER, B. S.,	*Assistant*
	ELMER R. TOBEY, B. S.,	*Assistant*
	HAROLD P. VANNAH, B. A.,	*Assistant*
	HARRY C. ALEXANDER,	*Laboratory Assistant*
ENTOMOLOGY	ALICE W. AVERILL,	*Laboratory Assistant*
	EDITH M. PATCH, PH. D.,	*Entomologist*
PLANT PATHOLOGY	WARNER J. MORSE, PH. D.,	*Pathologist*
	MICHAEL SHAPOVALOV, M. S.,	*Assistant*
	VERNON FOLSOM,	*Laboratory Assistant*
HIGHMOOR FARM	WELLINGTON SINCLAIR,	*Superintendent*
	HAROLD G. GULLIVER, B. A.,	*Scientific Aid*
ROYDEN L. HAMMOND,		*Seed analyst and Photographer*
CHARLES S. INMAN,		*Assistant*

B. OF D.
MAY 11 1914

BULLETIN 225.

CURRANT AND GOOSEBERRY APHIDS IN MAINE.*

Edith M. Patch.

During the past ten years several species of plantlice or aphids have been found feeding upon currant and gooseberry in Maine. In the spring, at which time the growing leaves and shoots are particularly susceptible to injury from sap sucking insects, these aphids are most abundant.

None of these species apparently passes the whole of its life-cycle on currants or gooseberries. *Schizoneura ulmi* (*fodiens*) winters on the elm and migrates to these bushes for the summer, while with the other species after feeding and multiplying upon these plants in the spring, each develops a winged migrant generation and departs to other vegetation for the summer, returning again in the fall to currant or gooseberry for the development of the generation of true sexes and the deposition of the winter eggs. Comparatively little active damage is done by the fall generation both because the aphids are not so numerous then and because the loss of sap to leaves through the season's growth is not so serious a matter to the plant.

This group of aphids has been both difficult and unsatisfactory to deal with. A single collection has frequently contained as many as four species with their innumerable progeny harmoniously feeding in mixed colonies on the same stem and leaves.

So little has been done with the species affecting *Ribes* in this country that I have not been able to coordinate the published fragments, and my own observations do no more than to give disjointed bits rather than to fill out any one life history as I should have liked. With so many species mixed on the same hostplants, however, Maine does not seem a very satisfactory field for following up the life cycles of the *Ribes* aphids and the present paper is prepared more especially to call attention to the perplexities of the situation in hopes that other workers may have some of the missing links to contribute.

---

*Papers from the Maine Agricultural Experiment Station: Entomology No. 71.

Aphis varians, n. sp.

White cornicled currant aphid.

Figs. 5, 6, 7, 34, 39.

By far the worst of the species under consideration is a plant louse which I fail to find recognizably described. It may be *grossulariæ* Kalt, but that name has been applied to several different species and it seems best to hold this distinct at least for the present. It is abundant upon cultivated currant, flowering currant, and wild gooseberries at Orono during the months of May and June, and complaints from West Paris, Maine, accompanying specimens state that it was present there in such numbers in the springs of 1910, 1911 and 1912 as to stunt the growth of the bushes and cause the leaves to turn brownish.

In Maine the stem-mother, that is the form which hatches from the over-wintering eggs, becomes full grown early in May if the weather conditions are right. During her growth she stations heself on the underside of a currant leaf which becomes puckered from the injuries caused by her feeding punctures. There in the protecting irregularities of the leaf she has deformed, she gives birth to a numerous progeny. When mature she is dark purplish green with a black "tail" or cauda, conspicuous milk white cornicles, and a 5-jointed antenna. (Fig. 5.) Her immediate progeny, the second spring generation, are dark green to dark brown. When they are first born their antenna is 4-jointed but the number of joints is increased to 5 at a subsequent molt which number it retains until the last molt

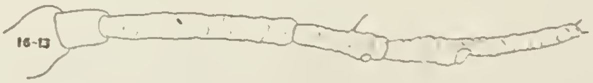


Fig. 5. *Aphis varians.* Antenna of stem female.

when it appears with 6 joints. Like the stem-mother, the second generation is without wings.

As these insects reproduce rapidly the colony soon gets too numerous to be sheltered by a single leaf so it scatters to infest the growing shoot and underside of fresh leaves. A thriving colony will distort the shoot seriously and cause the misshapen leaves to cluster in a dense protecting mass.

In June the young aphids are found bunched along the new shoot so thick that there is hardly room for anything except their greedy beaks to become attached. Some are a pale bright tan and some are gray, the color depending apparently on the length of time from a molt. The mature wingless forms and pupæ (individuals with black wing pads, about to become winged) are dark green with short but conspicuous milk white cornicles and black cauda, and the caudal part of the abdomen is transversely striped with black. The colony in a mass, however, has a slaty appearance on account of a fine white deposit of waxy powder secreted by these plantlice and causing a "bloom" on the bodies of the apterous forms. Parasited specimens are often present and these are globular, tan brown objects retaining the milk white color of the cornicles.

The pupæ, previously mentioned, belong to the third spring generation and are abundant early in June. When these develop wings the spring migration to the summer food plant takes place. These winged forms have head and thorax black and the abdomen dark green on both the dorsal and ventral surface, with transverse black bands at and caudad the cornicles. There are three large lateral black spots on the abdomen cephalad the cornicle and a fourth just caudad the cornicle. The cauda is black, and the cornicles dark instead of milk white as in the wingless forms. Antenna with sensoria in varying numbers on III, IV, and V, 20 to 30 on III, 15 more or less on IV and few to several on V, sometimes a stray one or two on VI besides the group at base of spur. These are shown in Fig. 6 (23-10) and Fig. 7 (28-13). There is a conspicuous

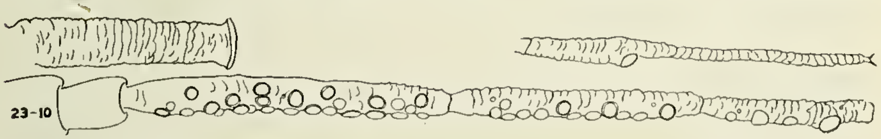


Fig. 6. *Aphis varians.* Antenna and cornicle of alate female.

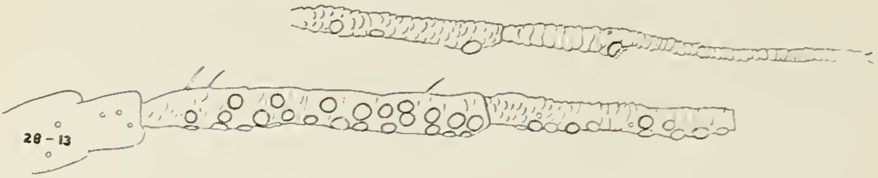


Fig. 7. *Aphis varians*, green variety. Antenna of alate female.

lateral tubercle on the prothorax, another on first abdominal segment, and a third between the cauda and cornicle. The wing is shown in Fig. 34 (23-10) and Fig. 39 (28-13).

In the fall a return migration to the currant and gooseberry occurs, the fall migrants give birth to nymphs which grow to mature males and egg laying females. Eggs are deposited upon the bushes where they remain all winter hatching in the first warm days of spring to the young stem-mother which is the point in the life cycle with which we began this account.

This species is characterized both in the winged and wingless forms by a prominent lateral tubercle on the prothorax, another on the first abdominal segment, and a third between the cornicle and cauda.

Maine collection numbers 6-04, 20-06, 48-05, 24-09, 23-10, 19-12, 16-13, 22-13, 28-13.

Aphis sanborni n. n.

Green aphid of gooseberry (23-13).

Figs. 8, 9, 10, 11, 29, 35.

Associated with the foregoing species upon wild gooseberry on the terminal shoots and ventral surface of the leaf, I found for the first time in 1913 a plantlouse at Highmoor Farm which I have named *sanborni*, thinking it probable that it is the species described without a name by Mr. C. E. Sanborn in Kansas Aphididæ (1904), p. 50-51, and Fig. 71.

The apterous forms are pale green and immaculate with water-white cornicles and pale cauda. The coloring of the pupa is the same except that the wing pads are dusky.

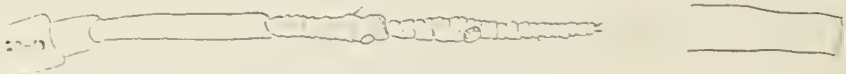


Fig. 8. *Aphis sanborni*. Antenna and cornicle of stem female.

The 5-jointed antenna of the stem mother (Fig. 8) (23-13) is not strikingly different from that of *varians* in its proportions.

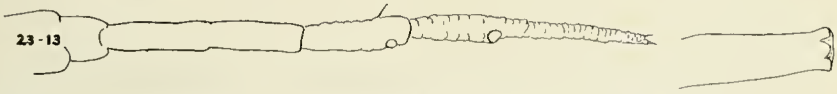


Fig. 9. *Aphis sanborni.* Antenna and cornicle of nymph.

The apterous second generation has during the nymphal stages a 5-jointed antenna, Fig. 9, which becomes 6-jointed at the last molt. Fig. 10. This is without sensoria except the usual ones on V and VI.

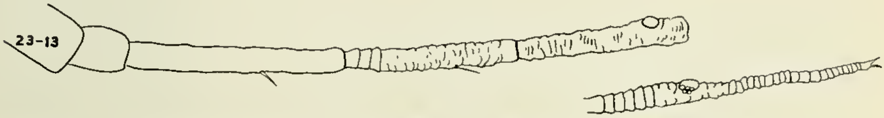


Fig. 10. *Aphis sanborni.* Antenna of apterous female.

The winged female of *sanborni* has antenna with 6 or 8 large circular sensoria in a row extending the full length of III, 6, more or less, similarly arranged on IV and none on V or VI except the terminal ones which are constant for those joints in all aphids. (Fig. 11.) The wing is shown in Fig. 35 and the imbricated cornicle in Fig. 11.

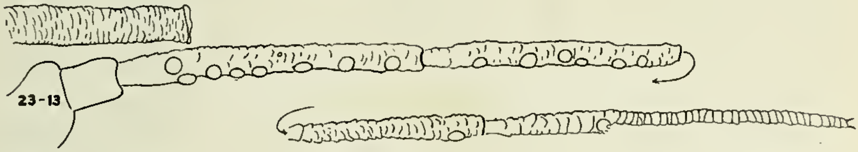


Fig. 11. *Aphis sanborni.* Antenna and cornicle of alate female.

I do not know the full cycle of *sanborni.* A collection taken May 28, 1913, from the leaves and stem shown in Fig. 29 comprised stem females, apterous females of the second generation, and pupæ with wing pads well developed. It would seem evident from this that the gooseberry is the winter host but concerning the rest of the cycle I know nothing.

Rhopalosiphum lactucæ? Kaltenbach.

Figs. 19, 20, 21, 22, 40.

A plant louse common in Maine upon currant in spring is probably the same as a similar one on sow thistle (*Sonchus* *arvensis*) in summer for it tallies with *lactucæ* recorded from *Sonchus* in Germany; and from currant, gooseberry, lettuce and sow thistle in England.*

Like the species previously discussed, this aphid winters on the currant in the egg stage, the spring generations feeding upon the sap of the growing leaves. The collections I have made from flowering currant have been mainly from the under surface of the leaves which their presence causes to curl and cluster though not in such a dense mass as those infested by *Aphis varians.* They are sometimes also found on the stem.

During the last of June winged and wingless females, pupæ and nymphs can still be found upon the currant. The winged females apparently take flight to lettuce, sow thistle, and probably to related plants, although I have not succeeded in making the transfers live under control conditions. These have shiny black heads; black antennæ with sensoria on III, IV and V, as shown in the figure; thoracic lobes black; ventral mesothoracic plate black; abdomen glabrous, light green with three large lateral black spots and one smaller one cephalad the cornicle, the cornicles being on a fourth large black spot, a mass of little black spots speckled near the cornicles and a median black blotch not quite reaching the base of cornicles; cornicles light green with black tip; cauda light green. The pupæ are uniform pale green with paler appendages; tips of cornicles and tarsi dusky; a few deeper green lines on abdomen.

Winged females of a later generation taken from sow thistle (*Sonchus arvensis*) about the first of August have the abdomen light yellowish green to olive green and the black markings as with the currant generation. The wingless females taken at the same time are entirely pale whitish or yellowish green and immaculate, and the same description answers for the nymphs. The pupæ are also pale yellowish green and immaculate like the wingless female, though the edge of the wing-pad is slightly dusky. The antennæ are shown in the figures.

In the fall winged females fly back to the currant.

---

*1912. Theobald. The Journal of Economic Biology, Vol. 7, pt. 3.

Myzus ribis Linn.

Figs. 12, 14, 15, 33, 41.

It is no uncommon thing to find currant leaves puffy with reddish or yellowish blister-like deformations such as are shown in Fig. 33. These are the home of *Myzus ribis,* a delicate little aphid not so serious in its work as *varians* because it attacks directly only the leaves but still troublesome enough to interfere with the proper functioning of the leaves, cause premature ripening of the fruit, and as one currant grower in the State puts his complaint against this species: "though the fruit holds on, the plants are hurt to a certain extent and look very annoying."

The stem-mother, or form hatching from the over-wintering egg, attains its growth in Maine about mid-May. This insect is very pale green with bright green spots in two longitudinal rows on the dorsal surface. Like the other apterous forms and nymphs the stem mother is rather thickly beset with capitate hairs shaped like minute pins with the points attached to the body.

The immediate progeny of the stem-mother are apparently partly winged and partly wingless, since I have taken colonies as early as May 20 containing the stem mother surrounded by nearly mature apterous forms and pupae. The apterous females, pupæ and nymphs of this species are ordinarily pale clear lemon yellow though sometimes nearly water white, and these small pale insects would have to be very numerous to be found if it were not for the telltale danger signal of reddish puffs which give evidence of their presence.

Both winged and wingless females are to be found on currant as late as mid-July, the winged forms migrating from time to time to the summer food plant. What this alternate food plant is is not known, for although this species is of practically world-wide distribution and has been recognized as a currant pest for a century and a half it has managed to elude detection during the summer residence.

The winged form when freshly molted is a clear pale lemon yellow. Later the dorsal surface of the head, the thoracic lobes and a quadrate patch on the abdomen become black. This quadrate black patch is 3-barred at the sides and covers 3 segments, the caudal edge being about on a line with the cornicles. In some collections this black dorsal decoration extends across the abdomen in transverse bars instead of a solid patch.

Structural details of the antennæ and wing are shown in the figures. The venation is erratic and no single wing can be chosen as surely "typical".

In life it is distinguished from the species next discussed by being characteristically lemon yellow and being more flatly appressed to the leaf. The two species are frequently intermingled upon the same leaf and are very likely both confused under the name *ribis*. I do not know which species has best claim to the name *ribis* but have been guided in my usage by specimens from the collections of other entomologists.

In balsam mounts the two species are most readily separated upon antennal characters. In *ribis* the terminal sensorium of V and the sensorium at base of spur on VI approximate the articulation between V and VI much more closely than is the case with *dispar*. III is more slender in *ribis* and the sensoria are proportionately larger. This portion of the antennæ of these two species is given (Figs. 12 and 13) drawn to the same scale and shows the distinctions here described. (30-13).

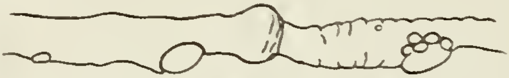


Fig. 12. *Myzus ribis* (30-13). Section of antenna of alate female for comparison with Fig. 13 which is drawn to the same scale.

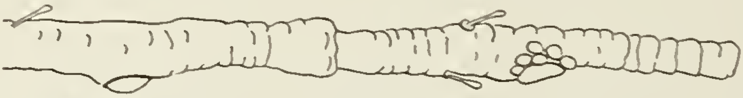


Fig. 13. *Myzus dispar* (29-13). Section of antenna of alate female for comparison with Fig. 12 which is drawn to the same scale.

Myzus dispar n. sp.

Figs. 13, 16, 17, 18, 37.

Collections of *Myzus* from gooseberry and currant in Maine show two closely allied species. The differences though rather slight and for the most part relative seem to be too constant to admit of interpreting them as varieties of a single species.

I have never taken any lemon yellow specimens of this species. The apterous viviparous females are greenish water white with longitudinal median and lateral lines (three in all) of vivid green. The winged female is very pale green with the three vivid longitudinal lines as mentioned for the apterous form and a few blackish transverse markings on caudal half of abdomen. The cornicles are water white, the cauda pale. The pupa is pale greenish white with the three green longitudinal lines, and when nearly ready for the final molt has thoracic lobes pellucid brownish like the thorax of the winged females. The hairs of this species are capitate like those of *ribis*.

Attention has already been called to the antennal dfferences of these two species. The wings of *dispar* like those of *ribis* are not uniform as to the vein angles and distances and any distinctions based on this character would be misleading. The cornicles of *dispar* are relatively shorter and less slender than those of *ribis*. (29-13).

Macrosiphum lactucæ.

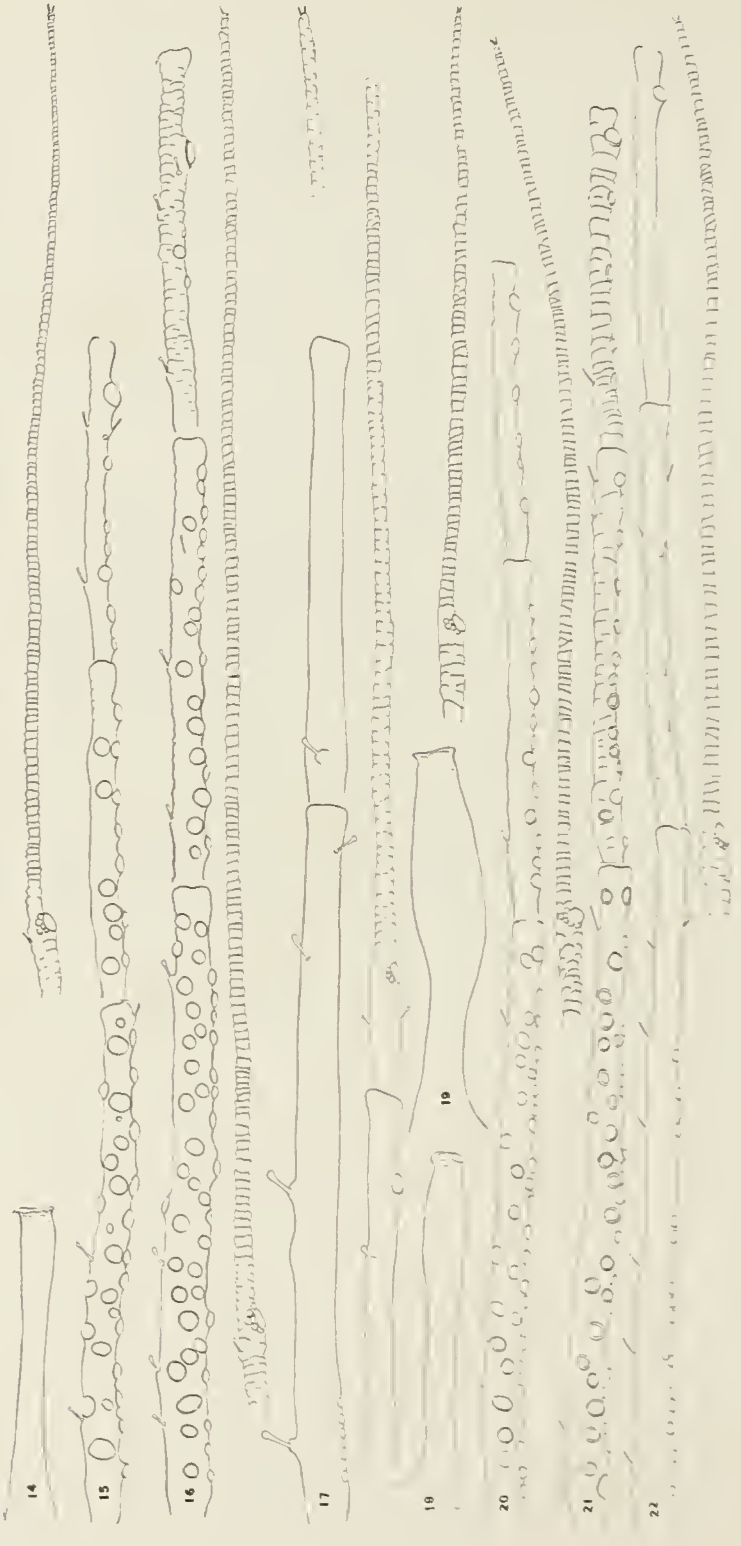
Figs. 23, 24, 25, 26, 27, 36, 38.

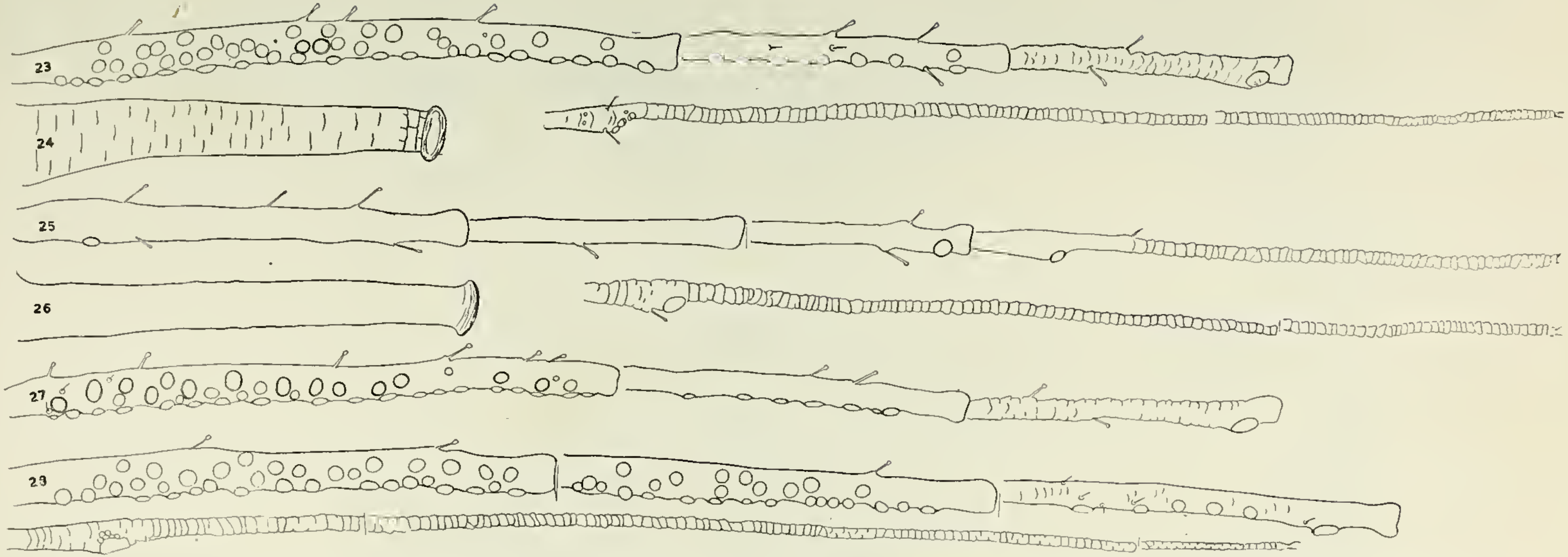
A common species on cultivated currant and gooseberry in Maine accords with specimens of *M. lactucæ* and I am recording it as that species provisionally for the present, athough I have not as yet made successful transfers to lettuce or *Sonchus*.

The character of the work of this aphid on gooseberry is shown in Fig. 30.

It is an alert, glistening, bristly species. The apterous viviparous females are green and without markings, with cauda and cornicles concolorous. The antenna with III slightly swollen along proximal half and with from one to several sensoria on swollen part. Fig. 25.

The winged viviparous females have the abdomen heavily marked with irregular black transverse bars, black cornicles and dark cauda. The cornicle has a few rather wrinkled reticulations at distal tip and a very faint imbrication over the rest of the surface. (Fig 24). The antennæ have sensoria on III and IV, as shown in Fig. 23. The wing is given in Fig. 38. (20-12) (27-13).





Figs. 14-15. *M. ribis*, antenna and cornicle of alate female. Fig. 16. *M. dispar*, antenna of alate female. Figs. 17-18. *M. dispar*, antenna and cornicle of apterous female. Figs. 19-20. *R. lactucae?* cornicle and antenna of alate female from currant. Figs. 21-22. *R. lactucae*, antennae of alate and apterous female from *Sonchus*. Figs. 23-24. *M. lactucae* (27-13), anntenna and cornicle of alate female from gooseberry. Figs. 25-26. *M. lactucae*, antenna and cornicle of apterous female from gooseberry, the antenna of this form having from one to several sensoria on III. Fig. 27. *M. lactucae* (20-12), antenna of alate female. Fig. 28. *Macrosiphum sp.* (20a-12), antenna of alate female.

Macrosiphum sp.

Fig. 28.

A distinct species of aphid was collected with (20-12) on currant leaf. A single winged viviparous female was preserved and as this may have been an accidental specimen resting on currant, no pains is taken to describe it here. The antenna, which is shown in Fig. 28 differs from *lactucæ* in having V with a row of sensoria, and IV thickly studded instead of with single row as in *lactucæ*. (20a-12).

Schizoneura ulmi (fodiens).

Collections of a woolly aphid curling the leaves of English elm, *Ulmus campestris*, were made in Maine during the summer of 1913. The life history of this species as worked out by European entomologists has been found to include a migration to currant and gooseberry bushes upon the roots of which the summer generations feed. Fall migrants are produced which return to the elm and the insect over winters on this tree in the egg stage. Fig. 32 shows the work of this aphid on elm. We have as yet no record of this insect as occurring upon gooseberry or currant in America, but the summer stages will no doubt be found to infest these plants here as in other countries.

A further discussion of this species is to be found in Bulletin 220 of this Station.

NOTE. All figures of antennæ and cornicles, except 12 and 13, are drawn to the same scale.

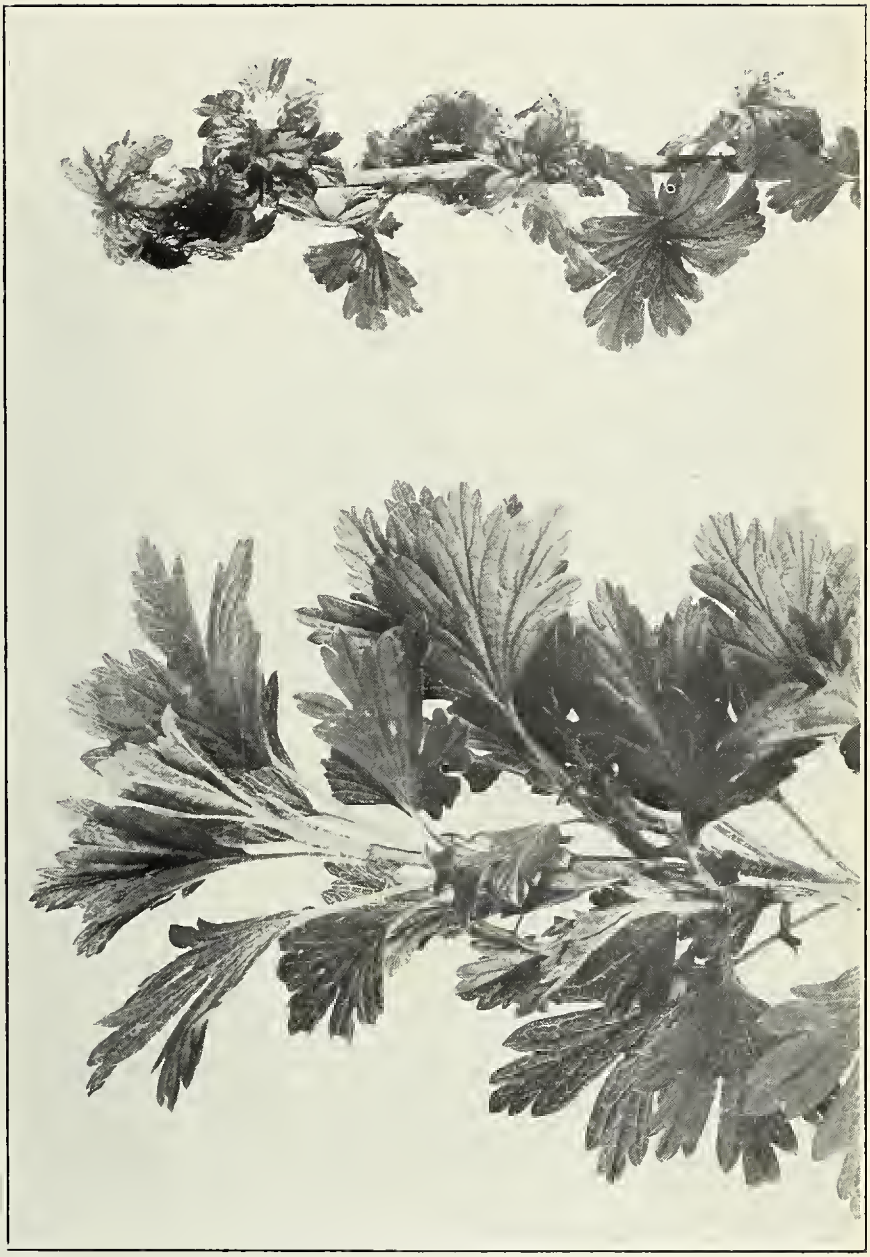


FIG. 29 —Wild gooseberry shoot infested by *A. sanborni*, and normal shoot from same bush, May 28, 1913.

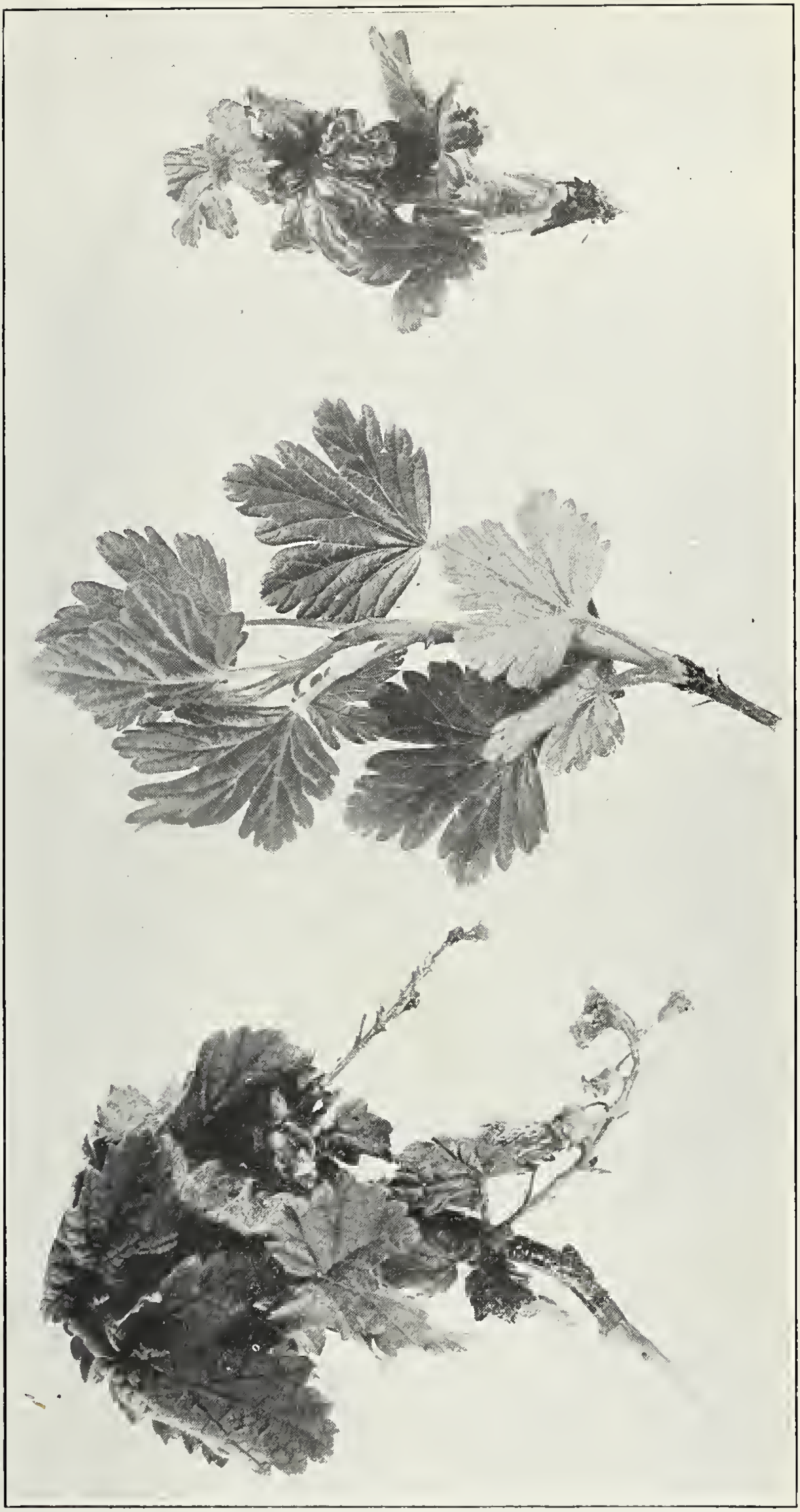
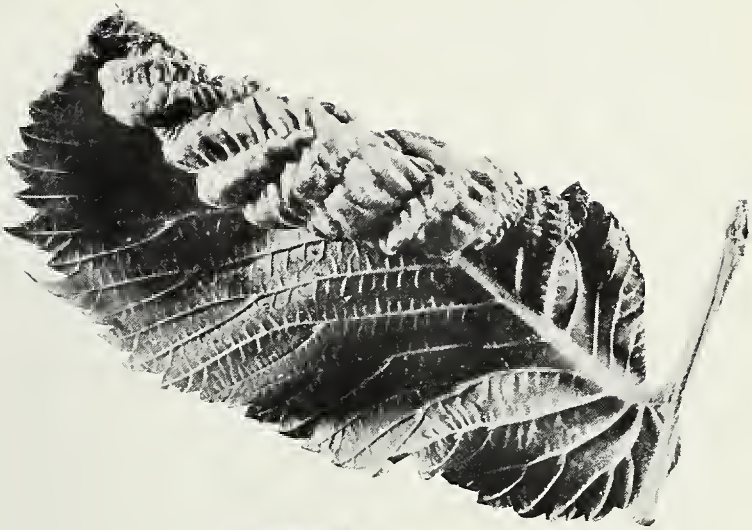


Fig. 30.—Gooseberry shoot infested by *M. lactucae*, and normal shoot from same bush, June 6, 1913. Fig. 31.—Currant shoot infested by *A. varians*, June 3, 1913.



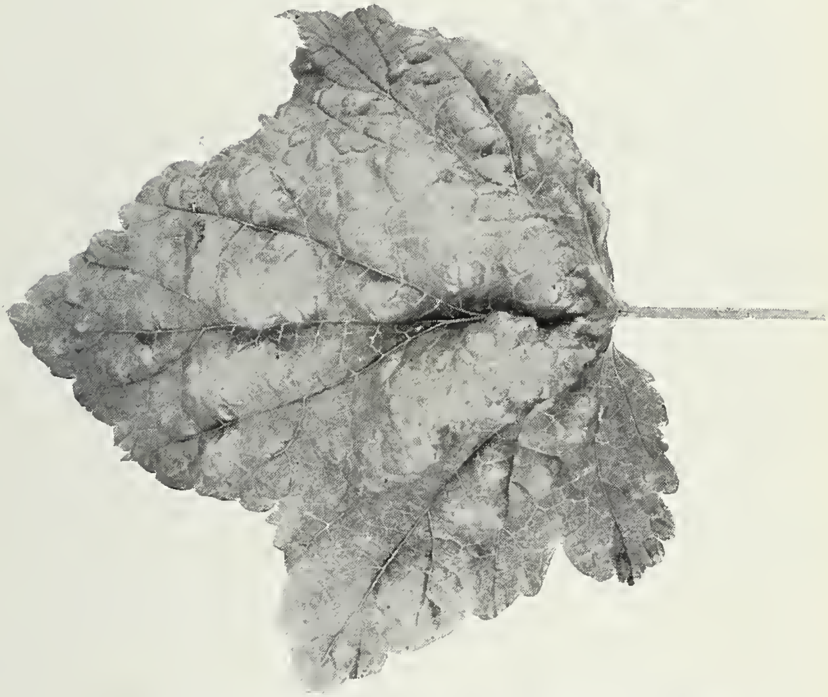
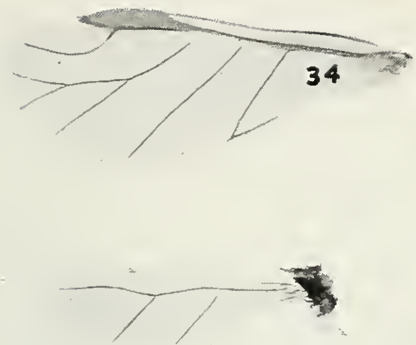
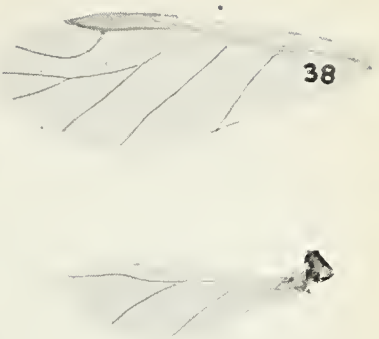
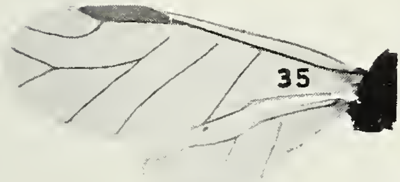
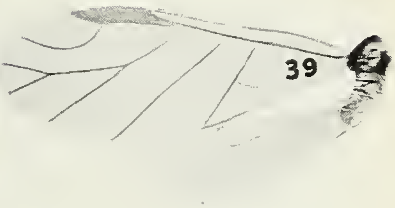


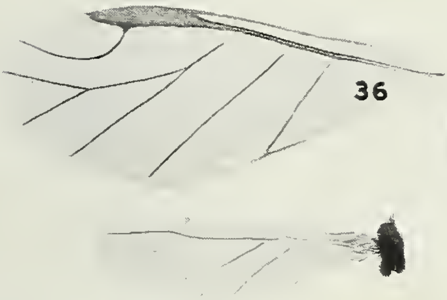
Fig. 32.—Work of *Schizoneura ulmi* (*fodiens*) on elm leaf.
Fig. 33.—Work of *Myzus* on currant leaf.

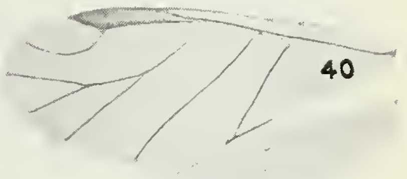


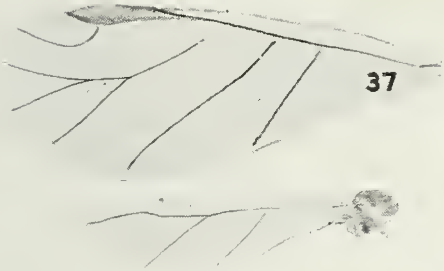












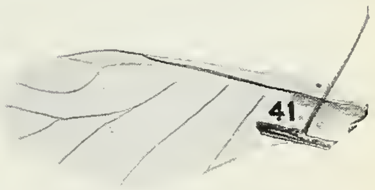


FIG. 34.—*Aphis varians* green variety (28–13); FIG. 35.—*A. Sanborni* (23–13); FIG. 36.—*Macrosiphum lactucae* from gooseberry (27–13); FIG. 37.—*Myzus dispar* (29–13); FIG. 38.—*M. lactucae* from currant (20–12); FIG. 39.—*A. varians* (24–09); FIG. 40.—*Rhopalosiphum lactucae* from *Sonchus* (86–10); FIG. 41.—*Myzus ribis* (25–09).

FOOD PLANT CATALOGUE OF THE APHIDAE OF THE WORLD.

PART IV.*

EDITH M. PATCH.

ANONACEAE. CUSTARD APPLE FAMILY.

ANONA.

A. muricata L.

Trichosiphum anonae Pergande. Pergande, 1906, p. 207.

A. rectilinata.

Aphis sassceri Wilson. Wilson, 1911, p. 59.

BERBERIDACEAE. BARBERRY FAMILY.

BERBERIS. Barberry.

B. communis.

Rhopalosiphum berberidis (Kalt.). Koch (Liosomaphis berberidis Walker). Buckton 2, p. 15.

B. vulgaris L. Common Barberry.

Rhopalosiphum berberidis (Kalt.) Davidson, 1910, p. 378.

Rhopalosiphum berberidis (Kalt.) (Aphis berberidis Fitch?) Thomas, 1879 p. 82.

B. sp.

Aphis berberidis Kalt. Kaltenbach, 1874, pp. 18-19.

Rhopalosiphum berberidis Kaltenbach. Davis, 1908 p. 254.

LAURACEAE. LAUREL FAMILY.

LAURUS.

L. laurustinus.

Aphis mali Fab. (?). Davidson, 1910, p. 377.

UMBELLULARIA.

U. californica Nutt. California laurel.

Hyadaphis umbellulariae Davidson. Davidson, 1911b, p. 559.

PAPAVERACEAE. POPPY FAMILY.

CHELIDONIUM. Celandine.

C. majus L.

Siphonophora chelidonii (Kalt.). Buckton, 1, p. 122.

Siphonophora urticae Kalt. Buckton, 1, p. 144.

---

* Papers from the Maine Agricultural Experiment Station: Entomology No. 72.

GLAUCIUM. Horn Poppy.

G. sp.

Siphonophora glaucii Licht. (ined.). Lichtenstein, La Flore.

PAPAVER. Poppy.

P. dubium L. (collinum).

Aphis papaveris Fab. Mordwilko, 1899 p. 169.

P. Hydrolapathum.

Aphis rumicis Linn. Walker, 1850a. p. 18.

P. Rhoeas L. Corn Poppy.

Aphis dianthi Schrank. Walker, 1850a. p. 394.

Aphis papaveris Fab. Buckton, 2, p. 92.

Aphis rumicis Linn. Walker, 1850a, p. 18.

P. somniferum L. (setigerum) Common Poppy.

Aphis papaveris Fab. Kaltenbach, 1874. p. 269.

Aphis rumicis Linn. Walker, 1850a. p. 18.

P. sp.

Aphis aparines Schrank. Lichtenstein, La Flore.

Aphis armata Hausmann. Lichtenstein, La Flore.

Aphis balsamitae Müller. Lichtenstein, La Flore.

Aphis rumicis Linn. Thomas, 1879 p. 88.

Aphis thlaspeos Schrank. Lichtenstein, La Flore.

FUMARIACEAE. FUMITORY FAMILY.

CORYDALIS.

C. aurea Willd. Golden Corydalis.

Nectarophora corydalis Oestlund. Oestlund, 1887, p. 82.

FUMARIA. Fumitory.

F. capreolata L.

Aphis papaveris Fab. Macchiati, 1883. p. 256.

F. officinalis L. Common Fumitory.

Aphis dianthi Schrank. Walker, 1850a. p. 394.

Aphis papaveris Fab. Macchiati, 1883. p. 256.

Aphis rumicis Linn. Walker, 1850a. p. 19.

CRUCIFERAE. MUSTARD FAMILY.

ALLIARIA. Garlic Mustard.

A. officinalis Andrz.

Aphis alliariae Koch. (sonchi L.) Kaltenbach, 1874. p. 28.

Aphis dianthi Schrank. Walker, 1850a. p. 394.

Aphis erysimi Kalt. Kaltenbach, 1874. p. 28.

Macrosiphum kaltenbachii Schouteden. Theobald, 1913, Journ. Econ. Biol. p. 52.

Siphonophora alliariae Koch. Buckton, 1, p. 124. Koch, p. 177.

A. sp.

Siphonophora sonchi Linn. Lichtenstein, Flore Supplement.

ALYSSUM.

A. maratimum Lam.

Myzus achyrantes Monell. Sanborn, 1904, p. 71.

ARABIS. Rock Cress.

A. canadensis L. (mollis Raf.) Sickle-pod.

Aphis (*Adactynus*) *arabis-mollis* Raf. Rafinesque, 1818.

BRASSICA. (Sinapis) Mustard.

B. adpressa Boiss. (Sinapis geniculata).

Aphis brassicae L. (A. raphani Schrank) (A. isatidis Boyer) Macchiati, 1883, p. 238.

B. alba Boiss. White Mustard.

Aphis brassicae Linn. Kaltenbach, 1874, p. 35.

Aphis dianthi Schrank. Walker, 1850a, p. 394.

B. arvensis L. (Sinapis arvensis). Charlock.

Aphis brassicae L. Kaltenbach, 1874, p. 35.

Rhopalosiphum persicae (Sulzer) Pass. (A. dianthi Schrank) (A. vulgaris Kyber) (A. rapae Curtis) (A. dubia Curtis) (A. vastator Smee.) Passerini, 1863, p. 21.

B. campestris L. (rutabaga).

Aphis brassicae L. (raphani Schrank) (isatidis Boyer). Passerini, 1863, p. 35.

Rhopalosiphum dianthi (Schrank) Koch. (persicae, Puceron du pecher Morren) (rapae Curtis, floris rapae Curtis, dubia? Curtis) (vastator Smee) (persicaecola Boisduval) (persicae Pass.) Buckton, 2, p. 17.

B. fruticulosa Cyril.

Aphis brassicae L. (A. raphani Schrank) (A. isatidis Boyer) Macchiati, 1883, p. 238.

B. juncea (L.) (Raphanus lanceolatus).

Aphis frangulae Kalt. Hunter, 1901, p. 130.

B. napus L. Rape.

Aphis (*Adactynus*) *brassica-napus* Raf. Rafinesque, 1818.

Aphis dianthi Schrank. Walker, 1850a, p. 394.

Myzus persicae Sulzer. Gillette and Taylor, 1908, p. 36.

B. nigra (L.) Koch. Black Mustard.

Aphis brasssicae Linn. Kaltenbach, 1874, p. 35.

Aphis dianthi Schrank. Walker, 1850a, p. 394.

Aphis maidi-radicis Forbes. Davis, 1909b, p. 124.

B. oleracea L. Cabbage. Kale.

Aphis brassicae Linn. (raphani Schrank) (floris-rapae Curtis) Buckton, 2, p. 34.

Aphis brassicae L. (raphani Schrank) (isatidis Boyer). Passerini, 1863, p. 35.

Aphis brassicae L. Sanborn, 1904, p. 55.

Aphis dianthi Schrank. Waker, 1850a, p. 394.

Aphis maidiradicis Forbes. Vickery, 1910, p. 111.

Aphis (*Tychea*) *phaseoli* Pass. Kaltenbach, 1874, p. 149.

Myzus persicae Sulzer. Gillette and Taylor, 1908, p 36.
Tychea phaseoli Pass. Karsch, 1886, p. 1.

B. Rapa L. Turnip. Ruta Baga.
Aphis rumicis Linn. Walker, 1850a. p. 19.
Myzus persicae Sulzer. Gillette and Taylor, 1908, p. 35.
Rhopalosiphum dianthi Schrank. Buckton 2, p. 17.

BUNIAS.

B. Erucago L.
Aphis brassicae Linn. (A. raphani Schrank) (A. isatidis Boyer) Macchiati, 1883 p. 238.

B. Kakile.
Aphis dianthi Schrank. Walker, 1850a, p 394.

CAPSELLA. Shepherd's Purse.

C. Bursa-pastoris (L.) Medic (Bursa Bursa-pastoris).
Aphis brassicae Linn. Buckton, 2. p. 34.
Aphis brassicae Linn (raphani Schrank) (floris-rapae Curtis) Buckton, 2. p. 34.
Aphis capsellae Koch. Koch. p. 76.
Aphis capsellae Kalt. Kaltenbach, 1874, p. 39. Theobald, 1911-12.
Aphis dianthi Schrank. Walker, 1850a, p. 394.
Aphis erysimi Kalt. Kaltenbach, 1874, p. 39.
Aphis erysimi Kalt. Kaltenbach, 1843, p 99.
Aphis gossypii Glover (citrifolii Ashm. *in* part) (citrulli Ashm.) (cucumeris Forbes) (forbesi Weed?). Pergande, 1895, p. 313.
Aphis maidiradicis Forbes. Vickery, 1910, p. 102.
Aphis papaveris Fab. Kaltenbach, 1874, p. 39.
Aphis plantaginis Schrank. Del Guercio, 1909 (1910). Redia VII, p. 297.
Aphis rumicis Linn. Thomas, 1879, p. 88.
Aphis symphyti Schrank. Kaltenbach, 1874, p. 771.
Forda occidentalis Hart. Hart, 1891 and 1892, p. 96.
Geoica squamosa Hart. Hart, 1891 and 1892, p. 99.
Macrosiphum scabiosae Buckton. Theobald, 1911-12.
Macrosiphum solanifolii Ashmead. Patch, 1907, p. 244.
Myzus persicae Sulzer. Gillette and Taylor, 1908, p. 36.
Schizoneura corni (Fab.) (S. venusta Pass.) (E. fungicola Walsh) (S. panicola Thomas) (E. cornicola Walsh). Hunter, 1901, p. 81.
Siphonophora pisi Kalt. (ulmariae Schrank) (onobrychis Boyer) (lathyri Walk.). Buckton, 1, p. 135.
Siphonophora ulmariae (Schrank) (onobrychis Boyer) (pisi Kalt.) (pisi Koch) (gei Koch). Passerini, 1863, p. 13.

CAKILE. Sea Rocket.

C. maritima Scop.
Aphis contermina Walker. Walker, 1849c, p. 31.
Aphis dianthi Schrank. Walker, 1850a, p. 394.

CHEIRANTHUS.

C. Cheiri L.

Pemphigus lactucarius Pass. (Amycla fuscicornis Koch). Buckton, 3, p. 125.

COCHLEARIA.

C. Armoracia L.

Aphis dianthi Schrank. Walker, 1850a, p. 394.
Aphis rumicis Linn. Walker, 1850a, p. 19.

C. sp.

Rhopalosiphum persicae Sulzer. Lichtenstein, Flore Supplement.

CRAMBE.

C. maritima L.

Aphis redundans Walker. Walker, 1849c, p. 32.

C. sp.

Aphis brassicae Linn. Lichtenstein, Flore Supplement.

DIPLOTAXIS.

D. tenuifolia DC.

Aphis brassicae L. (raphani Schrank) (isatidis Boyer). Passerini, 1863, p. 35.

ERYSIMUM. Treacle Mustard.

E. barbarea.

Aphis dianthi Schrank. Walker, 1850a, p. 394.

E. canescens Roth.

Aphis brassicae Linn. (A. raphani Schrank) (A. isatidis Boyer) Macchiati, 1883, p. 238.

E. officinale. See Sisymbrium officinale.

ISATIS.

I. tinctoria L.

Aphis brassicae Linn. Kaltenbach, 1874, p. 35.

I. sp.

Aphis isatidis Boyer. Lichtenstein, La Flore.

LEPIDIUM. Pepperwort.

L. Draba L.

Aphis myostidis Koch. Ferrari, 1872, p. 74.

L. incisum Roth. (Lepidium apetalum.)

Aphis maidiradicis Forbes. Vickery, 1910, p. 103.

L. virginicum L. Wild Peppergrass.

Aphis (*Adactynus*) *acaroides* Raf. Rafinesque, 1818.
Aphis gossypii Glover (citrifolii Ashm. In part) (citrulli Ash.) (cucumeris Forbes) (forbesi Weed?) Pergande, 1895, p. 313.
Aphis maidiradicis Forbes. Vickery, 1910, p. 103.

L. sp.

Aphis brassicae Linn. Lichtenstein, Flore Supplement.
Rhopalosiphum persicae Sulzer. Lichtenstein, Flore Supplement.

NASTURTIUM.

N. amphibium R. Br.
Aphis nasturtii Kalt. Kaltenbach, 1843, p. 76.
N. armoracia. See Radicula.
N. austriacum Crantz.
Aphis nasturtii Kalt. Passerini, 1863, p. 36.
N. officinale R.
Aphis dianthi Schrank. Walker, 1850a, p. 394.
N. sylvestre R. Br.
Aphis nasturtii Kalt. Kaltenbach, 1843, p. 76.
Siphonophora nasturtii Koch (A. nasturtii Kalt.?). Koch. p. 201.

RADICULA. Water Cress.

R. Armoracia (L.) Robinson. (Nasturtium armoracia). Horseradish.
Aphis armoraciae Cowen. Cowen. 1895, p. 118.
Myzus persicae Sulzer. Gillette and Taylor. 1908. p. 36.
R. Nasturtium-aquaticum (L.) (N. officinale) (Roripa Nasturtium) True Water Cress.
Myzus persicae Sulz. Gillette and Taylor. 1908. p. 35.
R. sinuata (Nutt) Greene. (Nasturtium sinuatum).
Pemphigus populitransversus Riley (burrowi Sanborn). Sanborn. 1904. p. 19. and 1906, p. 225.

RAPHANUS. Radish.

R. lanceolatus. See Brassica juncea.
R. Landra Mor.
Aphis brassicae L. (A. raphani Schrank) (A. isatidis Boyer) Macchiati. 1883, p. 238.
R. Raphanistrum L. Wild Radish, Jointed Charlock.
Aphis brassicae Linn. Kaltenbach. 1874. p. 41.
Aphis dianthi Schrank. Walker. 1850a, p. 394.
Aphis erysimi Kalt. Kaltenbach. 1874. p. 41.
R. sativus L. Radish.
Aphis brassicae Linn (raphani) Schrank (floris-rapae Curtis). Buckton, 2. p. 34.
Aphis dianthi Schrank. Walker. 1850a. p. 394.
Myzus persicae Sulzer. Gillette and Taylor, 1908. p. 35.

RAPISTRUM.

R. rugosum All. Fl. Pedem.
Rhopalosiphum persicae (Sulzer) Pass. (A. dianthi Schrank) (A. vulgaris Kyber) (A. rapae Curtis) (A. dubia Curt.) (A. vastator Smee). Passerini. 1863. p. 21.

RORIPA.

R. nasturtium. See Radicula nasturtium-aquaticum .

SISYMBRIUM. Hedge Mustard.

S. Alliaria Scop.
Siphonophora sonchi (L.) Pass. (A. serrutalae L. Schrank. Kalt) (S. achilleae Koch) (lactucae Koch?) Passerini. 1863. p. 17.

Siphonophora alliariae Koch. No. 1. Koch, p. 160.

S. officinale Scop. (Erysimum officinale).

Aphis erysimi Kalt. Kaltenbach, 1843, p. 99.

Siphonophora sisymbrii Buckton. Buckton, 1, p. 161.

S. sp.

Aphis nasturtii Kalt. Kaltenbach, 1874, p. 27.

THASPIS.

T. bursa-pastoris. See Capsella.

THLASPI. Penny Cress.

T. sp.

Aphis thlaspeos Schrank. Lichtenstein, Flore Supplement.

CAPPARIDACEAE. CAPER FAMILY.

POLANISIA.

P. graveolens Raf.

Aphis polanisiae Oestlund. Oestlund, 1887, p. 67.

Aphis (*Dactynus*) *polanisia-graveolens* Raf. Rafinesque, 1818.

SAXIFRAGACEAE. SAXIFRAGE FAMILY.

HEUCHERA. Alum Root.

H. hispida Pursh.

Siphonophora heucherae Thomas. Thomas, 1879, p. 66.

HYDRANGEA.

H. Hortensis Smith.

Aphis gossypii Glover (citrifolii Ashm. In part) (citrulli Ashm.) (cucumeris Forbes) (forbesi Weed?). Pergande, 1895, p. 314.

Aphis nerii Kalt. Passerini, 1863, p. 45.

PHILADELPHUS. Mock Orange. Syringa.

P. coronarius L. Mock Orange. Syringa.

Aphis gossypii Glover. Gillette, 1910, p. 404.

RIBES. Currant. Gooseberry.

R. alpinum L.

Aphis ribicola Kalt. Kaltenbach, 1843, p. 33.

Aphis ribis Linn. Kaltenbach, 1843, p. 39.

R. aureum Pursh. Missouri or Buffalo Currant.

Aphis cornifoliae Fitch. (A. gillettei Cowen). Gillette, 1910, p. 407.

Myzus ribis (Linn.) Hunter, 1901, p. 109.

R. cynosbati L. Prickly Gooseberry. Dogberry.

Macrosiphum cynosbati (Oestlund). Davis, 1909a, p. 39.

R. gracile Michx. Missouri Gooseberry.

Aphis n. sp. Sanborn. Sanborn, 1904, p. 48.

R. Grossularia L. European Gooseberry.

Aphis grossulariae Kaltenbach. (viburni Schrank?) Theobald, 1912, p. 100.

Aphis urticaria Kalt. Buckton, 2, p. 51.

Macrosiphum ribicola Kaltenbach. Theobald, 1911-12.

Myzus ribis (Linn.) Pass. (Ribifex Amyot) (Rh. ribis Koch). Buckton, 1, p. 181.

Myzus whitei Theobald. Theobald, 1912, p. 111.

Rhopalosiphum brittenii Theobald. Theobald, 1912, p. 108.

Rhopolosiphum loctucoe Kaltenbach. (ribis Buckton not Linn.) Theobald. 1912, p. 106.

Rhopolosiphum ribis (Linn.) Koch, Pass. Buckton, 2, p. 10.

Siphonophoro loctucae (Kalt.) Pass. Buckton. 1, p. 140.

R. leptanthum (A. Gray.

Myzus Neomexiconus Cockerell. Cockerell. 1901b. p. 227. "probably R. leptanthuni").

R. nigrum L. Black Currant.

Aphis grossulorioe Kaltenbach. (viburni Schrank?) Theobald, 1912, p. 100.

Macrosiphum lactucae Schrank. (A. ribicola Kaltenbach) (S. ribicola Koch) (S. lactucae Buckton, Passerini (non Koch) (ribis Frisch). Theobald, 1912, p. 104.

Myzus whitei Theobald. Theobald, 1912. p. 111.

Rhopolosiphum brittenii Theobald. Theobald. 1912. p. 108.

Rhopolosiphum ribis (Linn) Koch. Pass. Buckton, 2. p. 9.

Siphonophora lactucoe (Kalt.) Pass. Buckton. 1. p. 140.

R. rotundifolium Michx.

Myzus ribis (Linn.). Williams, 1891. p. 12.

Siphonophora sp. Williams. 1891, p. 12.

R. rubrum L.

Aphis grossulariae Kaltenbach (viburni Schrank?) Theobald. 1912, p. 100.

Aphis ribis Sanborn. Sanborn, 1904. p. 46.

Mocrosiphum loctucae Schrank (A. ribicola Kaltenbach) (S. ribicola Koch) (S. lactucae Buckton. Passerini (non Koch) (ribis Frisch). Theobald. 1912. p. 102.

Myzus ribis (Linn) Pass. Buckton. 1. p. 181. Theobald, 1912. p. 110.

Myzus ribis (Linn.). Weed. 1888. p. 210.

Rhopalosiphum brittenii Theobald. Theobald. 1912. p. 108.

Rhopalosiphum lactucae Kaltenbach. (R. ribis Buckton. non Linneaus (lactucae Buckton) (lactucae Passerini) Theobald. 1912. p. 105.

Rhopalosiphum ribis (Linn.) Koch. Pass. Buckton. 2. p. 10.

R. viscossisimum Pursh.

Myzus ribis Linn. Williams. 1891. p. 12.

R. sp.

Aphis houghtonensis Troop. Troop. 1906. p. 59

Aphis n. sp. Sanborn. Sanborn. 1904. p. 51.

Myzus cerasi (Fab.) Pass. (Cerasaphis Amyot). Buckton. 1. p. 175.

Schizoneura fodiens Buckton. Buckton. 3. p. 94.

Schizoneura ulmi Linn (fodiens Buckton). Tullgren. 1909. p. 169.

NOTE. The following families have been omitted from Part IV of this catalogue and will be printed in a subsequent part: *Resedaceae. Crassulaceae. Pittosporaceae. Hamamelidaceae. and Platanaceae.*

NATIONAL AGRICULTURAL LIBRARY
1022420494

NATIONAL AGRICULTURAL LIBRARY
1022420494